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Abstract

SOME PARTICULAR ASPECTS OF CONTROL IN NUCLEAR POWER REACTORS

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There are still many problems in the field of measurement and control of neutron flux. The present studies in connexion with high flux reactors contribute to the solution of these problems which concern specialists in reactor control.

The present state of this investigation and the results of different studies carried out in France by the C. E. A. and the E. D. F. are pointed out :

A - In the nuclear instrumentation field, work is at present devoted to the technologies used to develop detectors and cables, which have to work at high temperature and in a high γ background ; fast electronic techniques are applied to fission counters to measure low neutron fluxes in a high γ background (10^6 Rh).

B - In the control and safety field, there is a real need for studies on the behaviour of reactors in the subcritical state. This increases the margin of security during restarts when poison effects must be overcome.

The perturbations due to control rod movements necessitate a new

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organisation of power level safety and control assemblies, in connexion with thermal or activation measurements.

Two methods of fast start-up are described. They are related to the fission rate measurement as a function of time. This is done either continuously by a constant and high reactivity change, or step by step.

The application of automatic techniques to detector motion seems to give the answer to control and safety in normal start-up.

C - The scope of these studies covers the methods used for the control of E. D. F. 3, which are described.